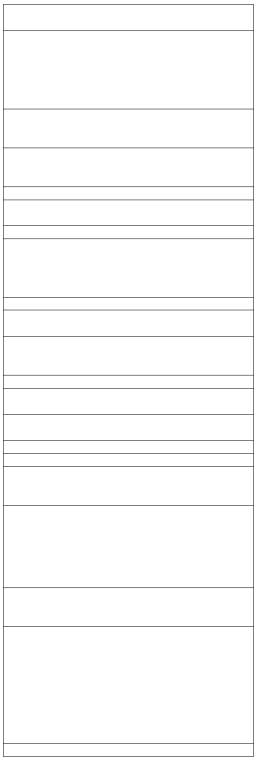
v.20120117 Preferred Options

	TMDL ELEMENTS	ELEMENT OBJECTIVE		ELEMENT COMPONET	COMPONET DESCRIPTION	SOURCE / SECTOR	SOURCE COMPONET	COMPONET DESCRIPTION
1	**Location Scope**	Identify the name and geographic location of the impaired or threatened waterbody for which the TMDL is being established.	a	Current 2004/2006 303(d) listed streams.	Watersheds for the North Fork Siuslaw and Big Elk Creek (Siletz-Yaquina)			
			b	Existing data or analysis that show water quality exceedances.	All watersheds upstream of sites that do not meet the biological index target (option 3a) or waterbodies where data or analysis demonstrate the turbidity standard (Pollunant 2b) are exceeded. Includes Siletz subbasin and many other sites in the Siuslaw subbasin.			
2	**Pollutant**	Identify the pollutant causing the impairment.	a	Excessive Sedimentation	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed. Road building and maintenance activities must be conducted in a manner so as to keep waste materials out of public waters and minimize erosion of cut banks, fills, and road surfaces. Waters of the State must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.			
			b	Turbidity	No more than 10% increase in natural stream turbidities as measured relative to a control point immediately upstream of the turbidity causing activity.			
3	**Target/ Loading Capacity**	Identify numeric or measurable indicators and target values that can be used to evaluate the TMDL and the restoration of the water quality in the listed waterbody.	a	Biological Index	target based on no more than 15% loss of taxa from an expected reference assemblage for which fine sediment is a contributing factor to the biological loss. The index relates directly to the narrative standard by assessing biological abundance present in the waterbody	Applies to all non point sources except roads or discrete discharge points such as stormwater outfalls		
			b	Conditional Turbidity Target	No more than 10% above background as measured from a control point upstream	Applies to roads and point sources only		
4	**Excess Load**	Identify the amount or degree by which the current pollutant load in the waterbody deviates from the pollutant load needed to attain or maintain water quality standards.	a	Factor comparison	Used to compare the pollutant load or the index based targets. (e.g. If existing observed biological index is 40 and the target level is 20, than existing conditions exceed the target by a factor of two.			
5	**Source Assessment/ Linkage Analysis**	Characterize the types, magnitudes, and locations of sources of pollutant loading to the waterbody and show how numeric targets and sources analysis results relate to each other and how they combine to yield estimates of pollutant loading capacity or needed pollutant reductions.	a	Phased Assessment	Sources are described by category with their respective pollutant pathways, processes, and mechanisms summarized from the literature. Pollutant loadings are not quantified but are linked to the impairment in the study area using relative hazard indicators and/or quantified by occurrence of conditions. For specific sources such as roads and landslides, further refinement of sources are conducted as an component of the TMDL implementation plans.	Roads	Sediment hazard potential map	This map will be used to identify locations in the road network where there is potential for discharge of sediment to a stream. The map will be produced using a GIS, LiDAR data, field data, or other local knowledge. The map will be the starting point for a road inventory and assessment required to conducted prior to submitting a TMDL implementation plan.
							Inventory and assessment (Phase II)	Named DMAs will be responsible for implementing a road inventory and assessment. The inventory will identify problem locations to be addressed in the sediment TMDL implementation plans.
						Landslides	Landslide hazard analysis and maps	A three tiered process will be implemented to inventory and assess Landslide prone areas (LPAs). The TMDL analysis will conduct a tier two analysis. (see attachment for more information). The tier two analysis will inventory and map existing mass wasting events and calculate the probability of mass wasting movement using modeling tools such as PISA-M or LAPSUS. The maps and analysis will be used to classify areas on the likelihood of human activities increasing the magnitude or severity of mass wasting that contribute sediment or would reduce the instream volume of wood to a stream.
							Surrogate Measures	Vegetation removal or land development will be prohibited in identified landslide hazard zones unless a tier III analysis and review has occurred.
						Bank Condition	Failing or unstable streambank analysis and map	A map will be produced identifying locations of unstable/downcut banks using ground observations, LiDAR data, and historical aerial photo analysis.
							Linkage Discussion and Analysis	Discussion of how banks become unstable/downcut, the relationship to sedimentation (erosion), and the human factors that contribute to unstable banks; including a discussion of riparian vegetation, and altered hydrological flows. Pollutant load estimates from failing banks may be calculated if sufficient historical aerial photos exist.
						Instream Condition	Wood volume inventory (Phase II inventory?)	A description of the wood volume inventoried during EMAP studies. Additional information may be sourced from other watershed analysis. A more site specfic wood inventory may be conducted and submitted as part of the TMDL implemenation plan, or as part of a landslide hazard Tier III analysis.
							Linkage Discussion and Analysis	The TMDL will Additional inventory and assessment can occur as part of the implementation planning or as part of a DMA administrative review process prior to permitting vegetation removal or land development. in the casDiscussion of the relationship between instream wood and sedimentation (deposition) and comparison of observed wood volumes to reference site wood volumes (derived from EMAP data and/or literature).

6	**Allocations/ Surrogate Measures**	Identify the point and nonpoint source loadings or surrogate measures that will attain the Target/Loading Capacity.	a	Target Based Reductions	Allocations use the factor based excess load approach to define the required reductions to meet the biological or turbidity targets. Allocations apply to geographic areas upstream of specific sites rather than to specific sources. The location of specific sites are used to monitor change through time. Targets for smaller geographic regions (or specific reaches) can be calculated to provide finer resolution for future monitoring. Surrogate measures are used to describe the management measures needed to meet the targets and will be used to evaluate implementation progress by DMAs.	Roads	TMDL objective	No road shall contribute more than 10% increase in stream turbidities as measured relative to a control point immediately upstream.
							Surrogate Measures	The TMDL will list or describe different types of potential road/stream crossing situations, describe or reference road or road/stream crossing BMPs. and provide a lookup matrix describing which BMP or suite of BMPS are to be used under a particular problem road situation. If specific road segments are identified during the TMDL process to be problems than those segments will be identified. A BMP may also include a site specific design approved by the relevant permitting authority.
						Landslides	TMDL objective	No increase in the natural frequency or severity of landslide events that contribute sediment to streams, or decrease delivery of wood volume below target wood volume in or delivered to streams.
							Surrogate Measures	Sufficient vegetation, or approate road and development restrictions must be implemented in landslide prone areas (LPAs) that have a high probability of reaching streams. A three tiered level of analysis will be conducted to determine hazard.
						Bank Condition	TMDL objective	No additional bank erosion from streambanks
							Surrogate Measures	System Potential Vegetation
						Instream Condition	TMDL objective	Sufficient instream structures to trap sediment.
							Surrogate Measures	Large wood volume per stream mile using ODFW reccomendations, or determined from the network of EMAP reference sites in the coast range, or literature. Focus or target areas for large wood can be refined using existing analysis or plans, local knowledge, or a model (e.g., LAPSUS, NetMap) as a decision support system.
7	**Margin of Safety**	Identify the implicit or explicit margin of safety that accounts for the uncertainty in the response of the	a	Implicit	An implicit margin of safety is accounted for through conservative assumptions in the analysis.			
			b	Explicit	An explicit margin of safety is incorporated by setting aside a portion (often 10%) of the loading capacity otherwise utilized for allocations. This can also be implemented with surrogate measures.			
8	**Seasonal Variation**	Identify the seasonal or interannual variation in the pollutant loading.	a	Data description	Demonstrates seasonal variation with interpretation of data (e.g., a sediment load or turbidity values related to flow per unit time).			
			b	Narrative description	Describes the seasonal variation narratively with a description of mechanisms and process that control sediment movement (precipitation, slope, etc).			
9	**Implementation / WQMP**	Define the DMAs responsible for implementing the TMDL control measures, the schedule for implementation, the monitoring and evaluation plan to validate TMDL elements and adequacy of proposed control measures, and provide a process for reviewing and revising TMDL elements.	a	Management strategies	Proposed management strategies designed to meet the allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category.			
			b	Timeline	Schedule for preparation and submission of Phase II source inventory and assessments, implementation plans, benchmarks or milestones, the ultimate timeline for attainment of water quality standards, and processes that trigger revisions to the timelines.	Roads	Phase II road assessment, inventory, and TMDL implementation plan	4 years from TMDL issuance??
						Other sources	TMDL implementation Plan	Except for roads, 18 months from TMDL issuance.
			c	Responsible Persons and DMAs	Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing implementation plans.	Forestry	ODF (primary) and significant forest landowners (secondary)	ODF acts as the primary DMA for private forest landowners where ODF has statutory authority through the forest practices act. Private forest landowners are the primary DMA where ODF does not have statutory authority at the time of TMDL issuance. ODF becomes the primary DMA once the board of forestry has approved modifications to the forest practices act sufficient to certify TMDL and water quality standard compliance. Criteria for naming significant forestry landowners may include all forest landowners with > 5000 acres of ownership in the Mid-Coast (18 private landowners and 2 federal agencies) or based on percentage of total ownership in the TMDL study watershed (TBA).
						Agriculture		ODA
						Urban/Rural		Counties, Cities, Special Districts, Parks
						Transportation		ODOT, Railroad companies, Ports,
			d	Phase II Source Inventory and Assessment	Identification of provisions and protocols for additional source inventory of roads and landslides.	Roads	Road inventory and assessment	Identification of problem road or stream crossign locations
						Landslides	Tier III analysis	Additional inventory, assessment, and refinement of landslide prone areas (LPAs) can be conducted at the site specific level if DMAs implement an administrative review and permitting process consistent with a tier 3 analysis.
			e	Monitoring	The plan to monitor and evaluate progress toward achieving TMDL objectives and water quality standards			
			f	Reasonable Assurance	Description of reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions.			
			g	Public Involvement	Plan for public involvement in implementing management strategies.			
			h	Long Term Implementation	Description of planned efforts to maintain management strategies over time			
			i	Costs	General discussion of costs and funding for implementing management strategies. Sector-specific or source-specific implementation plans may provide more detailed analyses of costs and funding for specific management strategies.			
			j	Legal Authorities	Citation of legal authorities relating to implementation of management strategies.			

IMPLICATIONS
Requires the narrative standards be interpreted into quantitative targets for use in TMDLs.
Works best when applied to point sources and road related discharges.
Simple and straightforward target to monitor and track during implementation. Data currently available at many Mid-Coast sites.
Requires new data collection for assessment and identification of a reference location for other sources. Linkage analysis and control measures needed to attain the target is complicated for non road sources.
Requires additional field data collection.
Requires development of an inventory framework and associated protocols. The framework should include what is an acceptable inventory and associated deliverables, and guidance on identifying what is a problem and what is not.



Tier	Analysis scale	Methods	Regulatory use and analysis period
1	Any scale (preliminary mapping or reconnaissance)	No field data. No modeling. Only aerial photo, LIDAR interpretation, or cursory screening using a GIS.	TMDL development
2	Regional (watershed or jurisdictional boundary)	Some field data (foot, vehicle, or air observation) or geotechnical modeling using regional field data (not site specfic) or literature derived variables	TMDL development or as part of a TMDL implementation plan.
3	Site specific (harvest unit, development unit)	Site conditions are field verified and used in conjunction with analysis for landslide hazard by certified geotechnical engineers. The proposed site plan shall demonstrate there is no increase in sedimentation to streams or decrease wood delivery to streams below instream wood volume targets.	TMDL development, or submitted as part of the TMDL Implementation plan, or during a DMA review and permitting process approved by DEQ.